IFBeam Database

Igor Mandrichenko

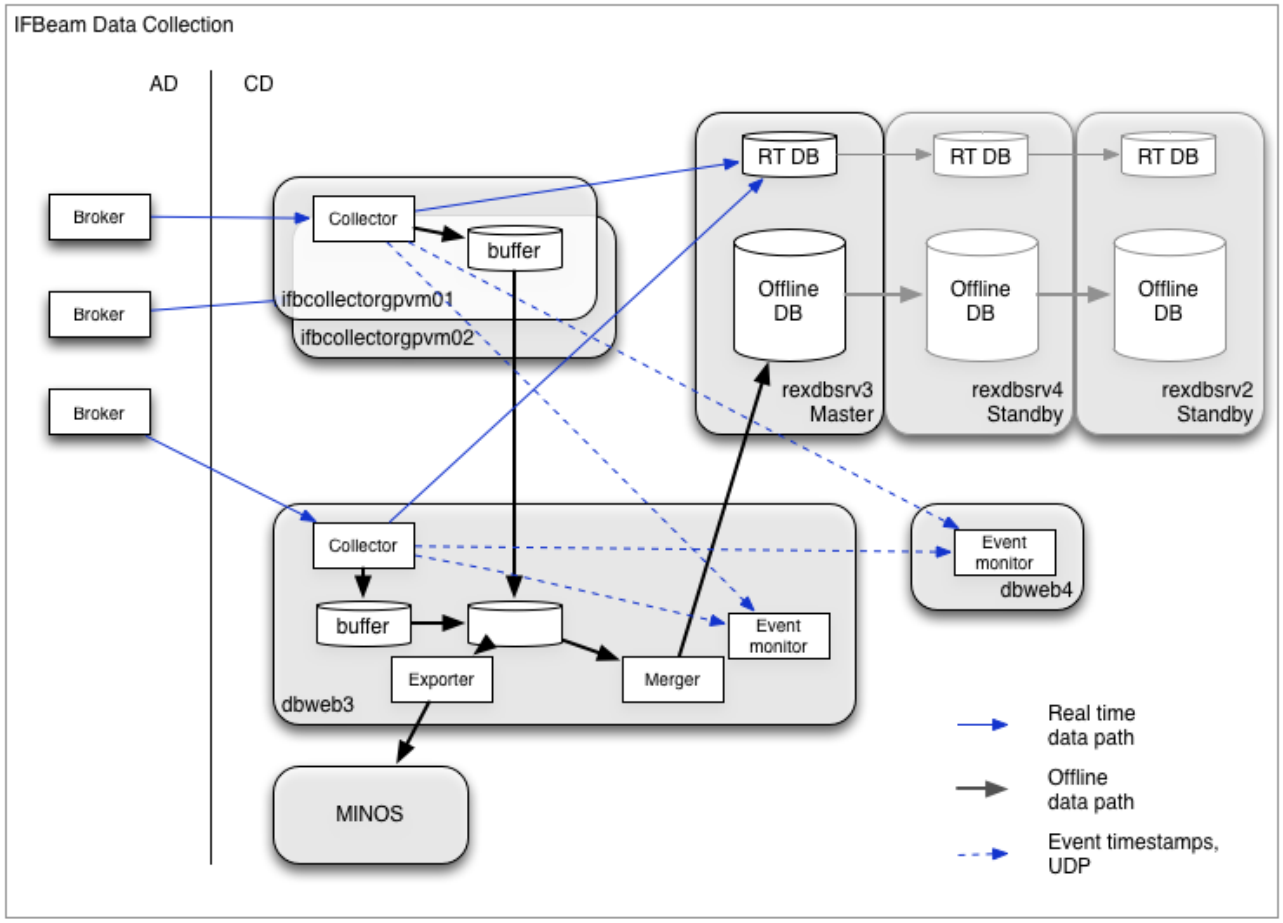
Presentation for LBNE

6/12/2014

History

- Project started in 2011
- Goal: provide common beam conditions database for all IF experiments primarily for off-line data processing
- In production since end of August 2011
- Collecting data ever since then
- 2.8 billion individual device measurements in long term storage
- Database size approaching 1.5 TB

How it works: data collection



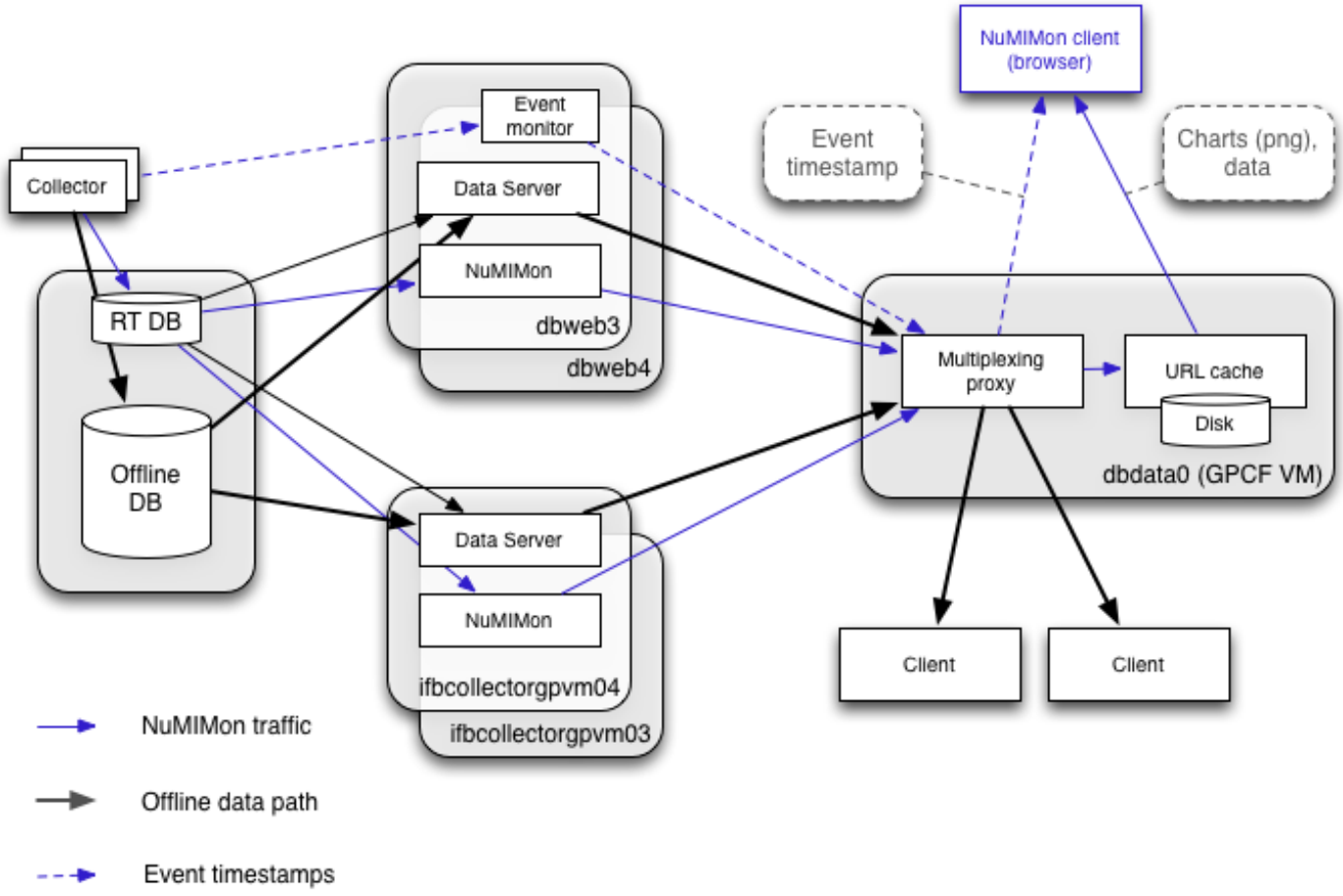
Data Preservation

- Data are stored in PosrgeSQL database, replicated 3 times on 3 separate servers
- On each server, data are stored on mirrored disk
- In total, 3x2=6 copies of data on disk
- Data backup: 2/week to BlueArc, 2 backup sets kept

Data Flow

- Real-time database, monitoring
  - All data, 1 hour
  - Latency: ~1 second
  - Sent by collector directly to the database
- Historical database, off-line processing
  - Short term data, about 600 devices, 1 month
  - Long term data, about 50 devices, forever
  - Latency: ~1 minute
  - Buffered on disk before sent to the database
- Users decide which data is short or long term

How it works: data distribution



Data Access

- All data access via HTTP, web service, no direct connection to the database
- Requests:
  - Device(t)
  - Device(t0, t1)
  - Set of devices(t)
  - Set of devices(t0, t1)
- We provide low level C library to access the web server
- Data access is controlled by multiplexing proxy
  - Spreads load among 4 data servers
  - Number of simultaneous requests allocated to different clients – grid vs. non-grid

Control

- Bundle is <event, list of devices>
- Bundles are created and managed via GUI
- Collecting bundles – data to collect
- Reading bundles – data to retrieve from DB
- New collecting bundles or modifications to existing bundles propagate to collectors automatically within minutes
- The system is open to collect anything AD provides, as long as we need disk space

Monitoring tools

- NuMI Beam Line Status Display:
  - http://dbweb3.fnal.gov:8080/ifbeam/numimon/Display
- Device monitor:
  - http://dbweb3.fnal.gov:8080/ifbeam/vmon/index?list=nova_standard
- Big Green Button (A9 event monitoring)
  - http://dbweb3.fnal.gov:8080/ifbeam/app/a9_monitor

LBNE

- What devices would need to be collected
- At what event (rate?)
- Expected data access rates
  - Frequencies, dataset sizes
- Any online monitoring ?